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Prospect '89

Inside this Issue:
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ISSUES IN EMPLOYMENT AND INCOME

REGIONAL PLANNING SERVICES
CALGARY REGIONAL PLANNING COMMISSION
JULY 1989

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1.0 INTRODUCTION

This report of the Prospect 1989 project focuses on issues of employment and income. Specifically, Chapter 2.0 examines employment patterns in the Calgary region during the 1980's, using federal census data. Employment by occupation type and industry group are discussed. Chapter 3.0 uses the technique of shift-share analysis to examine the changes in employment by industry, and determine how national and provincial economic growth, the performance of specific industries, and the strength of the regional economies influenced those changes. Chapter 4.0 looks at different trends in income levels during the 1980's, both by industry and by municipal averages. Finally, Chapter 5.0 offers some observations and conclusions about these issues.

These elements of the Calgary region's economy were chosen for analysis for three main reasons. First, the goals of local economic development initiatives often include increasing or diversifying employment, and increasing the income of residents. By establishing this foundation of 1980's data, future changes can be monitored and the impact of local, provincial, and national economic development efforts can be assessed. Second, the issues can be analyzed and discussed specifically for the Calgary region. The availability of specific local and regional data and of analysis techniques appropriate for the region permits discussion of direct relevance to the Calgary region. Third, the examination of regional employment and income patterns by industry leads into some discussion of various sectors of the economy, and of how residents of the region are affected by changes in those sectors.

2.0 EMPLOYMENT PATTERNS

2.1 Employment by Occupation Category

An important component of an analysis of the labour force includes some examination of the skills of those employed or available for work. This information is, however, difficult to obtain and is often not of sufficient detail to be useful. Employment by industry information, whether collected by the Calgary Regional Planning Commission's municipal census program or Statistics Canada's federal census, cannot be used to determine exactly what type of job, and subsequently what type of skills, residents of the region might possess. The federal census, however, also collects information about the type of occupation for members of the labour force, based on the actual type of work performed.

Table 2.1 shows the 1986 federal census results for the occupation of males and females.[1] The categories are based on the 1980 Standard Occupational Classification.* The results for the City of Calgary and for the region surrounding Calgary are shown.

These figures demonstrate the relative importance of each occupation type in providing employment for residents of the region.

There are some relatively significant differences in the occupation of men who live in Calgary and of those who live in the region surrounding Calgary. Men in the surrounding region were much more likely to be employed in primary occupations, which include farming, ranching, forestry, and oil and gas field occupations, than were men in Calgary. Calgary males, however, were more likely to work in technological, social, religious, and artistic, clerical, service or sales jobs than were their counterparts outside the City. These differences are most likely explained by the variations in job opportunities between a large urban centre and the smaller urban centres and rural areas that make up the region around Calgary.

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* A list of examples for each occupation category appears in Appendix II.

Table 2.1
Employment by Occupation and Sex: 1986

Occupation Type	Males				Females			
	City of Calgary		Region*		City of Calgary		Region*	
	#	%	#	%	#	%	#	%
Managerial, Administrative	31255	15.3	3420	14.6	14750	9.1	1235	7.2
Teaching	4960	2.4	495	2.1	8655	5.3	1085	6.4
Medicine, Health	3030	1.5	325	1.4	12095	7.5	1205	7.1
Technological, Social, Religious, Artistic	30570	15.0	1795	7.7	12465	7.7	820	4.8
Clerical	15640	7.7	805	3.4	63655	39.3	5675	33.3
Sales	22695	11.1	2030	8.7	16245	10.0	2030	11.9
Service	23715	11.6	1695	7.2	25475	15.7	2575	15.1
Primary	5510	2.7	4410	18.8	960	0.6	1470	8.6
Processing	4195	2.1	475	2.0	1045	0.6	90	0.5
Machining, Product Fabricating, Assembling, Repairing	19550	9.6	2300	9.8	2440	1.5	220	1.3
Construction Trades	19855	9.7	2800	12.0	585	0.4	75	0.4
Transport Equipment Operating	11485	5.6	1445	6.2	1050	0.6	280	1.6
Other	11195	5.5	1425	6.1	2660	1.6	295	1.7
Total	203655	100.0	23420	100.0	162080	100.0	17055	100.0

Source: Statistics Canada 1986, Profiles: Census Divisions and Subdivisions

Percentages may not add to 100.0 because of rounding.

*The Region refers to the Calgary region excluding the City of Calgary.

The figures may also support the conclusion that men in the region surrounding Calgary, for example, are most likely to have the skills associated with primary, managerial, construction trades, machining and product fabricating, assembling or repairing, and sales occupations. Together, these top five occupations accounted for almost two-thirds of the labour force. Male residents of this area may be less likely to be using skills associated with clerical, teaching, processing, or medical occupations.

Among females, there are some differences between women who live in Calgary and women who live outside the City, but the variation is less significant than it is for males. Women in the region outside the City were more likely to be employed in primary occupations than their Calgary counterparts, while Calgary women were more likely to work in clerical or technological, social, religious and artistic occupations than women outside the City. However, the top five occupations for each group are very similar, with clerical occupations clearly dominating. This relative lack of variation between women from a large urban centre and women from smaller urban centres or rural areas may reflect the more limited range of occupational types traditionally held by women.

The figures would suggest that women throughout the region, including Calgary, are most likely to have skills associated with clerical service, sales, managerial, or medical occupations, and are most unlikely to possess skills in transport equipment operating, machining and product fabricating, assembling and repairing, processing and construction occupations.

A comparison of the 1986 figures with those of the 1981 federal census yields some interesting results. Table 2.2 shows the 1981 data for the City of Calgary and the region surrounding Calgary. There are some markedly different rates of change among the different occupation types, between the sexes, and between the City of Calgary and its surrounding region, as shown on Table 2.3.

First, the total number of males in the region surrounding Calgary working in the different occupational groups increased by about 3.7%, while the number of working males in the City of Calgary actually declined by 0.3%. Growth occupations for males throughout the region include the services, medicine and health, sales, and primary categories. For females, the occupations with the fastest rates of growth include medicine and health, sales, services and technological, social, religious and artistic occupations. Overall, the number of females employed in different occupation groups increased significantly both within the City of Calgary (17.2%) and in the surrounding region (25.9%).

Table 2.2
Employment by Occupation and Sex: 1981

Occupation Type	Males				Females			
	City of Calgary		Region*		City of Calgary		Region*	
	#	%	#	%	#	%	#	%
Managerial, Administrative	29735	14.6	3220	14.3	10835	7.6	1045	7.9
Teaching	4410	2.2	555	2.5	6945	4.9	805	6.1
Medicine, Health	2540	1.2	280	1.2	9775	6.8	690	5.2
Technological, Social, Religious, Artistic	28340	13.9	1745	7.7	9525	6.7	615	4.6
Clerical	13910	6.8	835	3.7	62470	43.7	4675	35.3
Sales	20760	10.2	1600	7.1	14625	10.2	1255	9.5
Service	17910	8.8	1090	4.8	19640	13.7	1920	14.5
Primary	4745	2.3	4360	19.3	950	0.7	1265	9.5
Processing	4735	2.3	505	2.2	1110	0.8	105	0.8
Machining, Product Fabricating, Assembling, Repairing	21880	10.7	2200	9.7	2770	1.9	285	2.1
Construction Trades	33075	16.2	3705	16.4	N/A	---	N/A	---
Transport Equipment Operating	11915	5.8	1370	6.1	N/A	---	N/A	---
Other	10225	5.0	1120	5.0	4395	3.1	600	4.5
Total	204180	100.0	22585	100.0	143040	100.0	13260	100.0

Source: Statistics Canada 1981, Census of Canada: Census Divisions and Subdivisions: Selected Social and Economic Characteristics.

Percentages may not add to 100.0 because of rounding.

*The Region refers to the Calgary region excluding the City of Calgary.

Table 2.3
Rate of Change by Occupation Type and Sex: 1981 to 1986

Occupation Type	Males		Females	
	City of Calgary %	Region %	City of Calgary %	Region* %
Managerial, Administrative	5.1	6.2	36.1	18.2
Teaching	12.5	-10.8	24.6	34.8
Medicine, Health	19.3	16.1	32.0	74.6
Technological, Social, Religious, Artistic	7.9	2.9	30.9	33.3
Clerical	12.4	-3.6	1.9	21.4
Sales	9.3	26.9	55.2	61.8
Service	32.4	55.5	29.7	34.1
Primary	16.1	1.1	1.1	16.2
Processing	-11.4	-5.9	-5.9	-14.3
Machining, Product Fabricating, Assembling, Repairing	-10.6	4.5	-11.9	-22.8
Construction Trades	-40.0	-24.4	----	----
Transport Equipment Operating	-3.6	5.5	----	----
Other	9.5	27.2	-39.5	-50.8
Total	-0.3	3.7	17.2	25.9

Source: Statistics Canada 1981, Census of Canada: Census Divisions and Subdivisions: Selected Social and Economic Characteristics.

Statistics Canada 1986, Profiles: Census Divisions and Subdivisions.

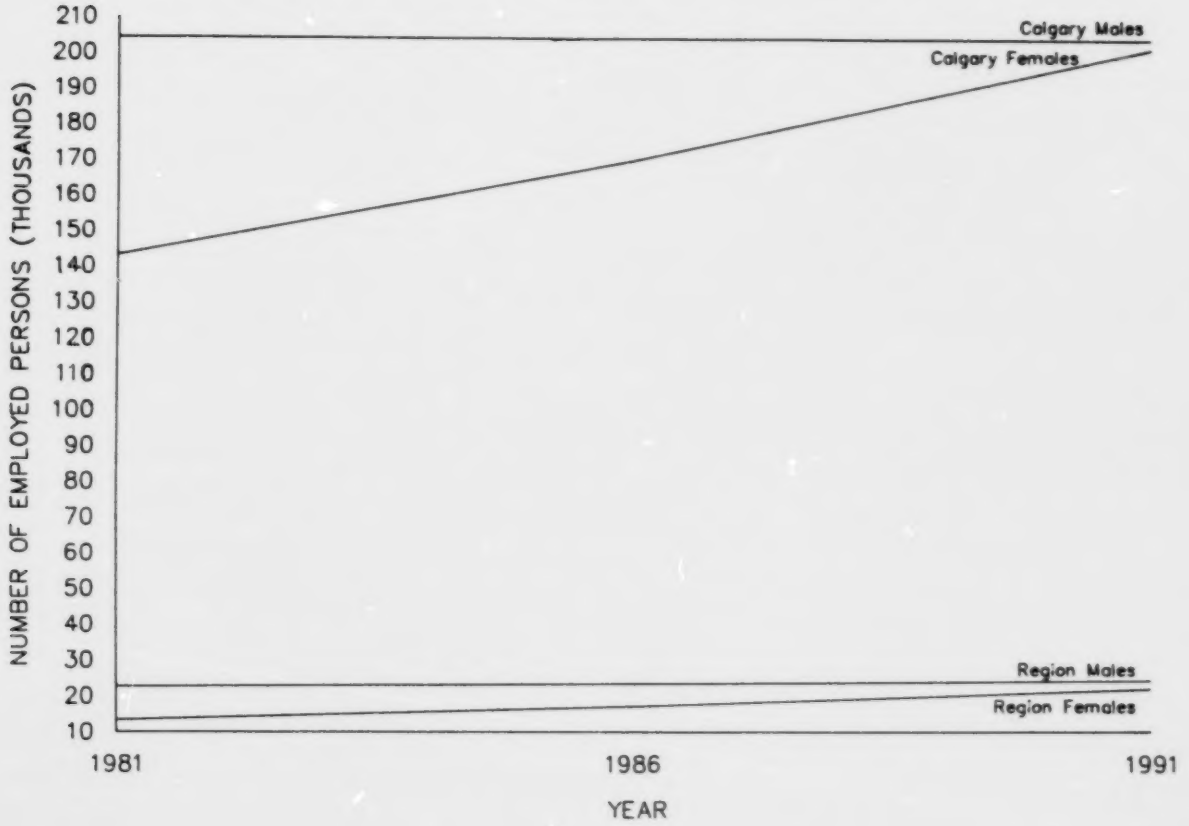
Significant declines in the employment of males occurred in the construction trades, processing, teaching, machining, product fabricating, assembling and repairing categories. However, this may not necessarily mean that the region lost jobs of these types to the extent indicated by the percentage figures. Because of the nature of the data, which measure the occupation of residents of the region, some of these declines may be caused by men moving out of the region or to the City of Calgary. In such cases, they may have continued to work in the same occupation at the same location, but their results are included at the new place of residence. This possibility indicates the difficulty of using the occupation information as a barometer of the change in the number of occupations in the region as a whole or in any individual municipality.

Nevertheless, the information is still useful as a general indicator of employment patterns and of the changing nature of the labour force living within the region. For example, there may be significantly fewer men with construction skills in the region surrounding Calgary now than there were in 1981. Conversely, there may be significantly more men with skills associated with service occupations.

The figures show that employment in the combined occupation types for females increased by 3,440 jobs among those living in the region surrounding Calgary, and by 24,665 jobs among those living in Calgary, compared to an increase of 835 jobs among males in the surrounding region and a decrease of 525 jobs among males living in Calgary. The result is relatively stable male employment with few occupations demonstrating rapid growth, and dramatically increasing female employment with significant growth in several different occupational categories. The 1986 figures show that female employment was about 83% of male employment in the City of Calgary and about 73% of male employment in the surrounding region. Ignoring for the moment the arguments against projecting the 1981 to 1986 trend into the future, such projection to 1991 would yield a female employment figure of 97% of male employment for the City of Calgary and 88% of male employment for the surrounding region (see Figure 2.1).

Figure 2.1
PROJECTION OF EMPLOYMENT FIGURES

Source: Statistics Canada



Even if the growth rate of the period between 1981 and 1986 is not being repeated in the curent five-year period, it is probably safe to assume that the female employment is still increasing at a greater rate than male employment, and that, in the future, the number of women working will equal the number of men working. This trend would have implications for the growth rates of those occupations that attract women, commuting patterns, family and household income, the need for child care, fertility rates, and other factors influenced by working women.

2.2 Employment by Industry Category

Employment patterns can also be examined according to industry group. This classification ignores the types of jobs performed by an individual, and instead categorizes residents according to the industry for which they work. This structure shows the relative significance of each major industry group as a provider of employment within the Calgary region.

Table 2.4 shows the 1986 federal census results for the industry by which residents of the region are employed.[3] The categories are based on the 1980 Standard Industrial Classification.* The table shows the results for the City of Calgary and for the region surrounding Calgary.

These figures demonstrate the relative importance of each of the major industry groups in providing employment throughout the region. Generally, the same major industry groups are significant inside and outside the City of Calgary. Industries in the Other Services category are very important in each case, as are trade and primary industries. (Primary industries include both agriculture and oil and gas industries.) Combined, these three groups employ almost two-thirds of the working adult population in each of the City of Calgary and the region surrounding the City. The construction industry employs a slightly larger percentage of the population outside the City of Calgary than it does within the City, and a slightly larger proportion of Calgary residents is employed by finance, insurance, and real estate industries than is true for the region surrounding Calgary.

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* A list of examples for each industry category appears in Appendix II.

Table 2.4
Employment by Industry: 1986

Industry Type	City of Calgary #	City of Calgary %	Region* #	Region* %
Primary	35180	9.6	8560	21.6
Manufacturing	32270	8.8	3210	8.1
Construction	24110	6.6	3175	8.0
Transportation, Utilities and Communications	30950	8.4	3090	7.8
Trade	63500	17.3	5780	14.6
Finance, Insurance and Real Estate	24470	6.7	1660	4.2
Government	21205	5.8	2480	6.3
Other Services	134845	36.8	11655	29.4
Total	366530	100.0	39610	100.0

Source: Statistics Canada 1986 Profiles Census Divisions and Subdivisions

Percentages may not add to 100.0 because of rounding.

*The Region refers to the Calgary region excluding the City of Calgary.

There are some variations among the municipalities in the region around Calgary, which likely reflect the different functions of some of the different municipalities. Some, for example, provide goods and services to relatively large areas, and could therefore be expected to have more residents employed in the trade and services sectors. It is also important to note that people who commute to employment in a different municipality are included in these figures. Therefore, those municipalities with large proportions of the employed labour force commuting to Calgary, for example, may show a pattern of employment more similar to a large city than to similar-sized communities with fewer commuters.

The 1986 figures show some differences from the 1981 Employment by Industry figures, shown in Table 2.5.[4] First, within the City of Calgary, the

construction industry slipped from having the third largest proportion of employed people in 1981 to having the seventh five years later. The industry employed almost 12% of the labour force at the beginning of the period, and only about 7% by 1986. The Other Services category employed the largest proportion of the Calgary labour force in both 1981 and 1986, but the share of the total increased from about 31% in 1981 to about 37% in 1986.

Table 2.5
Employment by Industry: 1981

Industry Type	City of Calgary #	City of Calgary %	Region* #	Region* %
Primary	32840	9.5	7975	22.6
Manufacturing	34030	9.8	3160	9.0
Construction	40615	11.7	4350	12.3
Transportation, Utilities and Communications	29415	8.5	3040	8.6
Trade	59185	17.0	5080	14.4
Finance, Insurance and Real Estate	25230	7.3	1590	4.5
Government	19025	5.5	2175	6.2
Other Services	106860	30.8	8600	24.4
Total	347200	100.0	35295	100.0

Source: Statistics Canada 1981, Census of Canada: Census Divisions and Subdivisions: Selected Social and Economic Characteristics.

Percentages may not add to 100.0 because of rounding.

*The Region refers to the Calgary region excluding the City of Calgary.

In the region surrounding the City of Calgary, the same general changes occurred. The construction industry slipped in ranking from employing the fourth-largest percentage of the labour force to the fifth, and fell from over 12% of the total to 8%. Other Services industries dominated throughout the period and increased their share of total employment from about 2% to almost 30%.

The preceding comparison of 1981 and 1986 information has concentrated on the structure of the labour force: That is, it has attempted to illustrate how the labour force was divided among the eight main industry groups, and how that pattern changed from 1981 to 1986. The rest of this section, and the following chapter examines each industry category to determine how employment in each has changed over the five-year period.

Table 2.6 shows the rate of change in employment by industry from 1981 to 1986 for the City of Calgary the region surrounding Calgary, and for the region as a whole. These figures, then, illustrate the industries with the fastest growing employment in each area, the industry where employment did not grow as quickly and the industry in which employment actually declined.

Table 2.6

Rate of Change in Employment by Industry: 1981 to 1986

Industry Type	City of Calgary	Region (excluding Calgary)	Region (including Calgary)
Primary	7.1%	7.3%	7.2%
Manufacturing	-5.2	1.6	-4.6
Construction	-40.6	-27.0	-39.3
Transportation, Utilities and Communications	5.2	1.6	4.9
Trade	7.3	13.8	7.8
Finance, Insurance and Real Estate	-3.0	4.4	-2.6
Government	11.5	14.0	11.7
Other Services	26.2	35.5	26.9
Total	5.6	12.2	6.2

Source: Statistics Canada 1981, Census of Canada: Census Divisions and Subdivisions: Selected Social and Economic Characteristics.

Statistics Canada 1986, Profiles: Census Divisions and Subdivisions.

It is important to remember, here, that the figures do not differentiate

between people employed in their municipality of residence and people who commute to another municipality to work. Therefore, the distinctions between the City of Calgary and the surrounding region are less clear-cut. They do show, however, the extent to which residents of the two areas rely on the different industry groups for employment.

Throughout the region, service industries clearly showed the greatest increase in employment. Employment in this sector actually grew more quickly in the region surrounding Calgary than in the City itself. Employment in government also showed significant growth, followed by trade and primary industries. Again, employment in trade increased more quickly in the region outside the City than it did within Calgary. Employment in transportation, communication and utilities increased overall, although it did so only slightly in the region outside Calgary.

The industry showing the greatest decline in employment was construction. Although the rate of decrease was rapid throughout the region, construction employment in the area surrounding Calgary declined more slowly than in the City. Employment in manufacturing and finance, insurance and real estate also declined overall and within the City of Calgary, but employment in both increased in the surrounding region.

Although this information is helpful in understanding employment change in individual industry categories over time, it ignores some factors. The following chapter will identify these factors and analyze them.

3.0 A SHIFT-SHARE ANALYSIS OF EMPLOYMENT IN THE CALGARY REGION

The straightforward comparison of 1981 and 1986 employment by industry figures discussed in the previous section is helpful, but it ignores some critical factors. There is no discussion of how the increases or decreases in employment compare to employment change in the economy overall. There is no discussion of how the apparent changes relate to employment change in a particular industry. There is no discussion of how the changes compare to employment change in the local economy.

3.1 Shift-Share Analysis

The technique used to account for these factors is called shift-share analysis.[5]. The term refers to "the difference between actual change and the change expected on a proportionally shared basis."[6] This method attempts to separate the change in a factor like employment into three components which contribute to such change: increases or decreases in the number of people employed in the economy as a whole; increases or decreases in the number of people employed in specific industries within the economy; and increases of decreases in employment within specific industries in the local economy.[7] The combined effects of these three components produce the actual change in local employment.

For example, the method can be used to measure differences between the change in employment throughout the national economy and, first, the change in employment in specific industries in the national economy, and second, the change in employment in specific industries in the local economy. The differences help to assess whether a specific industry has performed better or worse than the economy as a whole, and whether a local economy has performed better or worse than the national economy.

To perform a shift-share analysis, data are required for two points in time for both a reference economy and a local economy. The most common data used for this analysis are employment by industry figures. Such data are readily available from sources like Statistics Canada and the

information used in the previous section is perfectly suitable. Calculations are then made (using Lotus 1-2-3 computer software) to determine:

(1) employment growth in the reference economy;

(2) the difference between employment growth in a specific industry within the reference economy and employment growth in the reference economy overall[8] (this demonstrates the strength of a specific national sector); and

(3) the difference between employment growth in a specific industry in the local economy and employment growth in that industry in the reference economy[9] (this demonstrates the strength of the attraction to the local area).

3.1.1 Strengths and Weaknesses of Shift-Share Analysis[10]

The results of such analysis can help to determine strengths and weaknesses of the local economy by pin-pointing the proportion of the employment change resulting from the performance of the reference economy, and the proportion resulting from the performance of the local economy. This demonstrates the degree of local competitiveness. Of course, this is only one means of analyzing historical trends. The causes of such trends are not isolated, and projections based on the trends alone are not always reliable. In addition, the different components may not in fact be mutually exclusive.

However, as one relatively simple method of accounting for and describing employment trends, shift-share analysis deserves some attention. The same technique can also be applied to change in income and population.

3.2 Employment by Industry in the Calgary Region

Using the technique described briefly above, employment by industry data for the region as the local economy and for, first, the nation, and sec-

ond, the province of Alberta as the reference economy were examined.[11] The region, representing the total of all municipal data within the planning area, including the City of Calgary, was chosen as the local economy. This choice contributes to the regional focus of this project, and avoids the problems caused by employment "leakages" so prevalent in the Calgary region when looking at individual municipalities. That is, since many people commute to municipalities other than their municipality of residence, an examination of one municiipality may over-represent some industries, and under-represent others. As relatively few people commute outside the region, this problem is less of a concern at the regional level.

3.2.1 The Regional Economy Compared to the Canadian Economy

The first shift-share analysis to be discussed compares the regional economy to the Canadian economy. The results of this analysis are shown in Table 3.1. In this section, the results for each industry will be explained and interpreted.

First, the first two columns of figures show the numbers of people employed in each major industrial group within the region for 1981 and 1986. (These same figures are used in the previous section. See Tables 2.4 and 2.5).

The next pair of columns of figures show the numbers of people employed in each major industrial group throughout Canada for 1981 and 1986. These data therefore establish the trend for both the local and reference economies. The column headed "Growth in Canadian Employment" is derived by determining the growth in total employment in Canada between 1981 and 1986, and therefore the same number (about 5.7%) is applied to the examination of each industry. This number, then, reflects the strength of the Canadian economy.

The column headed "Industry Performance - Economy Performance" shows the difference between changes in employment within each industry throughout

TABLE 3.1

SHIFT-SHARE ANALYSIS: REGION TO CANADA: 1981 to 1986

	EMPLOYMENT IN THE REGION		EMPLOYMENT IN CANADA		GROWTH IN CANADIAN EMPLOYMENT	INDUSTRY PERFORMANCE-ECONOMY PERFORMANCE	INDUSTRY PERFORMANCE (REGION) - INDUSTRY PERFORMANCE (CANADA)
SECTOR NAME	1981	1986	1981	1986			
PRIMARY	40815	43740	844195	865510	0.0569	-0.0317	0.0464
MANUFACTURING	37190	35480	2279360	2196745	0.0569	-0.0932	-0.0097
CONSTRUCTION	45065	27285	767105	759165	0.0569	-0.0673	-0.3842
TRANSPORTATION, COMMUNICATION, UTILITIES	32455	34040	960770	977605	0.0569	-0.0394	0.0313
TRADE	64265	69280	2004135	2190850	0.0569	-0.0362	-0.0151
FINANCE, INSURANCE, REAL ESTATE	26820	26130	636070	690895	0.0569	0.0293	-0.1119
GOVERNMENT	21200	23685	908155	969280	0.0569	0.0104	0.0499
OTHER SERVICES	115460	146500	3477245	4090180	0.0569	0.1194	0.0926
TOTAL	383270	406140	12054155	12740230	0.0569	0.0000	0.0028

Source: Statistics Canada
John D. Landers, "Electronic Spreadsheets in Planning: The Case of the Shift-Share Analysis" American Planning Association Journal, Spring 1985.

Canada and the changes in employment in the economy overall. Therefore, the 0.0569 figure is subtracted from the growth in employment in each industry. Negative results show employment in the industry grew more slowly than employment in the economy overall, while positive results show that employment in the industry grew more quickly than employment in the economy overall. The number therefore reflects the strength of the industry nationally.

The final column of figures, headed "Industry Performance (Region) - Industry Performance (Canada)", shows the difference between changes in employment within a specific industry in the region and changes in employment within a specific industry in the Canadian economy. Negative results show that employment in a specific industry within the region grew more slowly than employment within that industry nationally. Positive results show that employment in a specific industry within the region grew more quickly than employment in that industry nationally. This number therefore reflects the strength of the attraction to the region.

Now that this basic structure has been established, the results for each industry can be interpreted, and some observations can be made. First, the primary sector will be used as an example. The previous chapter, showing the straightforward changes in employment, demonstrated that employment in the primary sector grew by 2,925 jobs, or 7.2%. (The primary sector includes farming, ranching and oil and gas industries). The calculations in Table 3.1 split that increase into its three components. First, employment throughout the national economy increased by about 5.7%. Second, employment in the primary sector in the Canadian economy declined by about 3.2% after accounting for the overall growth. Third, employment in the regional primary sector increased by 4.6% after accounting for national increases in employment and the nation-wide decline in primary sector employment.

These figures support the conclusion that, between 1981 and 1986, Canada's primary sector did worse than other Canadian industries generally, while the regional primary sector performed better than its national

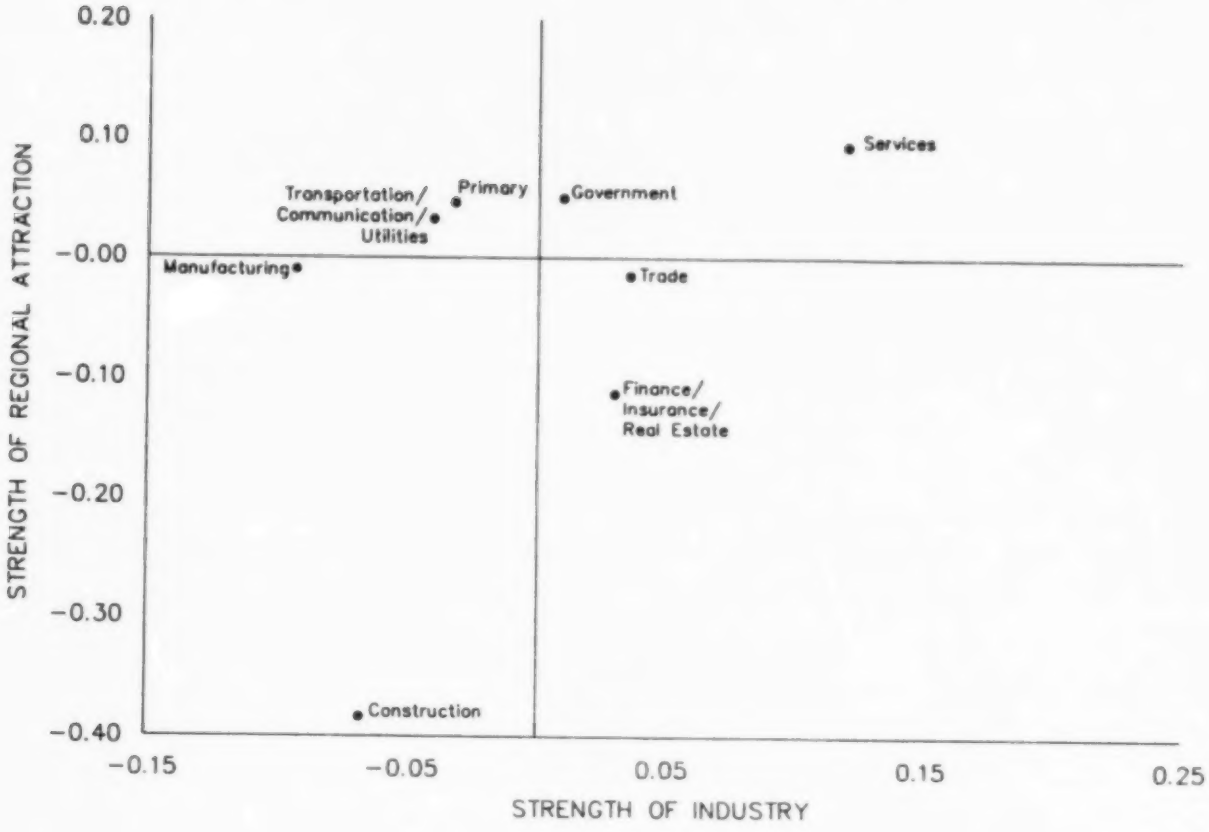
counterpart, thereby demonstrating that this region is competitive in this sector.

The figures can also be used to establish the number of jobs lost and gained as a result of the performance of different components of the economy. The performance of the economy overall added about 2,322 jobs to the regional primary sector, the poor performance of the national primary sector accounted for the loss of about 1,294 jobs, and the growth of the regional primary sector accounted for an increase of about 1,894 jobs. The combined net result of these figures is the 2,925 jobs created in the regional primary sector.

Of course, these figures represent a conceptual division of the actual change in employment in the three components. The figures do not suggest, for example, that 1,294 people actually lost their jobs in the primary sector because of that sector's poor performance nationally. Instead, it may be helpful to view that figure as representing the number of jobs the primary sector did not require in the Calgary region because of its national decline. Likewise, the 2,322 and 1,894 figures can be interpreted as the number of additional primary sector jobs required in the Calgary region because of the growth in employment overall and the growth of the local primary sector respectively.

Figure 3.1 shows a useful means of summarizing the shift-share analysis of employment patterns in the region.[12] The vertical scale represents the performance of local economic sectors as compared to national economic sectors. The horizontal scale represents the performance of national economic sectors compared to the national economy as a whole. The four quadrants of the graph represent the four possible combinations of regional and national findings. The upper right-hand quadrant contains those sectors that are growing both nationally and regionally relative to the national economy. The bottom right-hand quadrant contains those sectors that are growing nationally but declining regionally. The bottom left-hand quadrant contains industries that are declining both nationally and regionally. The upper left-hand quadrant contains those industries

Figure 3.1
SUMMARY OF REGION TO CANADA ANALYSIS



that are declining nationally but increasing regionally. The different industries are arranged on the graph by plotting the last two columns of Table 3.1 for each sector. Therefore, the primary sector appears at -0.0317 on the horizontal scale and +0.0464 on the vertical scale.

Based on this analysis, certain conclusions can be drawn about broad strengths and weaknesses in the region. Our region appears to have an advantage in the services, government, primary, and transportation, communication and utilities sectors. In these industries, the region performed better than the nation. On the other hand, the region performed worse than the nation in the trade and finance, insurance and real estate sectors, and both the region and the nation did badly in the manufacturing and construction sectors. (Note that employment in manufaturing declined more slowly in the region than it did in the nation). The net result is that, after controlling for nation-wide employment growth, total employment in the mix of regional sectors increased by only 0.3% between 1981 and 1986.

Of course, it is important to note that 1981 represents about the peak of the regional boom caused by the growth of the oil and gas industry which was followed by several years of recession. The five-year period covered by the data, then, chronicles the recessionary decline from peak regional employment.

It is also very interesting to examine the effects of each component of the change in employment, as shown on Table 3.2. The change in employment in each sector can be divided into three components: the overall growth in employment, which Table 3.2 calls "Strength of National Economy"; the relative change in a specific national sector, which is "Strength of Industry" on Table 3.2; and the relative change in a specific regional sector, which is "Strength of Regional Attraction" on Table 3.2.

Table 3.2

Changes in Employment by Component

Sector	Strength of National Economy	Strength of Industry	Strength of Regional Attraction
Primary	2322	-1294	1894
Manufacturing	2116	-3466	-361
Construction	2564	-3032	-17314
Transportation, Utilities and Communications	1847	-1279	1016
Trade	3657	2326	-970
Finance, Insurance and Real Estate	1526	786	-3001
Government	1206	220	1058
Other Services	6570	13786	10692
Total	21808	8047	-6986

It is evident that the strength of the national economy contributed most of the growth in employment within our region, both overall and in most individual sectors between 1981 and 1986. In total, employment growth in the Canadian economy accounted for an increase of almost 22,000 jobs in the region. This component accounted for most of the growth in every sector except the other services industries, probably because employment in this sector is growing much more quickly than employment overall.

The strength of industry component contributed 8,047 jobs overall and was responsible for most of the increase in the other services sectors.

The strength of regional attraction component was a close second as an engine for employment growth in the other services, primary, government and transportation, communications and utilities sectors, but the increases here were not enough to offset the decreases in the other sectors, and in particulary in construction. Therefore, overall, the region lost almost 7,000 jobs because of weak regional attraction. Again, the

circumstances of the period in question probably produce this result, and the previous period (1976 to 1981) and the current period (1986 to 1991) are not likely to be the same.

In fact, shift-share analysis can be used to forecast employment growth by projecting and adjusting the past trends.[13] However, given that the circumstances of the analyzed period (rapid declines from peak employment) are not being duplicated by the current five-year period (characerized by gradual recovery), a forecast based on the above analysis would be of limited value, and is not included in this report.

The analysis itself, however, is useful in determining those areas in which the region is strong, despite adverse circumstances, and therefore which are likely to continue to be strong into the future.

3.2.2 The Regional Economy Compared to the Alberta Economy

As outlined above, a second shift-share analysis can be performed using the region as the local economy and the province of Alberta as the reference economy. The results of this analysis are shown in Table 3.3. The results for each industry will be discussed and interpreted in this section. First, it may be helpful to repeat the explanation of the structure of the table.

As before, the first two columns of figures show the numbers of people employed in each major industrial group within the region for 1981 and 1986. The next pair of columns of figures show the numbers of people employed in each major industrial group throughout Alberta for 1981 and 1986. The column headed "Growth in Alberta Employment" is derived by determining the growth in total employment in Alberta between 1981 and 1986, and therefore the same number (about 6.7%) is applied to each industry. This number reflects the strength of the provincial economy.

The column headed "Industry Performance - Economy Performance" shows the difference between changes in employment within each industry throughout

TABLE 3.3

SHIFT-SHARE ANALYSIS: REGION TO ALBERTA 1981 to 1986

SECTOR NAME	EMPLOYMENT IN THE REGION 1981	EMPLOYMENT IN THE REGION 1986	EMPLOYMENT IN ALBERTA 1981	EMPLOYMENT IN ALBERTA 1986	GROWTH IN ALBERTAN EMPLOYMENT	INDUSTRY PERFORMANCE-ECONOMY PERFORMANCE	INDUSTRY PERFORMANCE (REGION) - INDUSTRY PERFORMANCE (ALBERTA)
PRIMARY	40815	43740	164035	175870	0.0665	0.0056	-0.0005
MANUFACTURING	37190	35480	108005	100230	0.0665	-0.1385	0.0260
CONSTRUCTION	45065	27285	128810	92025	0.0665	-0.3521	-0.1090
TRANSPORTATION, COMMUNICATION, UTILITIES	32455	34040	100365	105465	0.0665	-0.0157	-0.0020
TRADE	64265	69280	202680	215075	0.0665	-0.0054	0.0169
FINANCE, INSURANCE, REAL ESTATE	26820	26130	65860	64705	0.0665	-0.0841	-0.0082
GOVERNMENT	21200	23685	88675	97690	0.0665	0.0351	0.0156
OTHER SERVICES	115460	146500	336740	423635	0.0665	0.1915	0.0108
TOTAL	383270	406140	1195170	1274695	0.0665	0.0000	-0.0069

Source: Statistics Canada
John D. Landers, "Electronic Spreadsheets in Planning: The Case of the Shift-Share Analysis" American Planning Association Journal, Spring 1985.

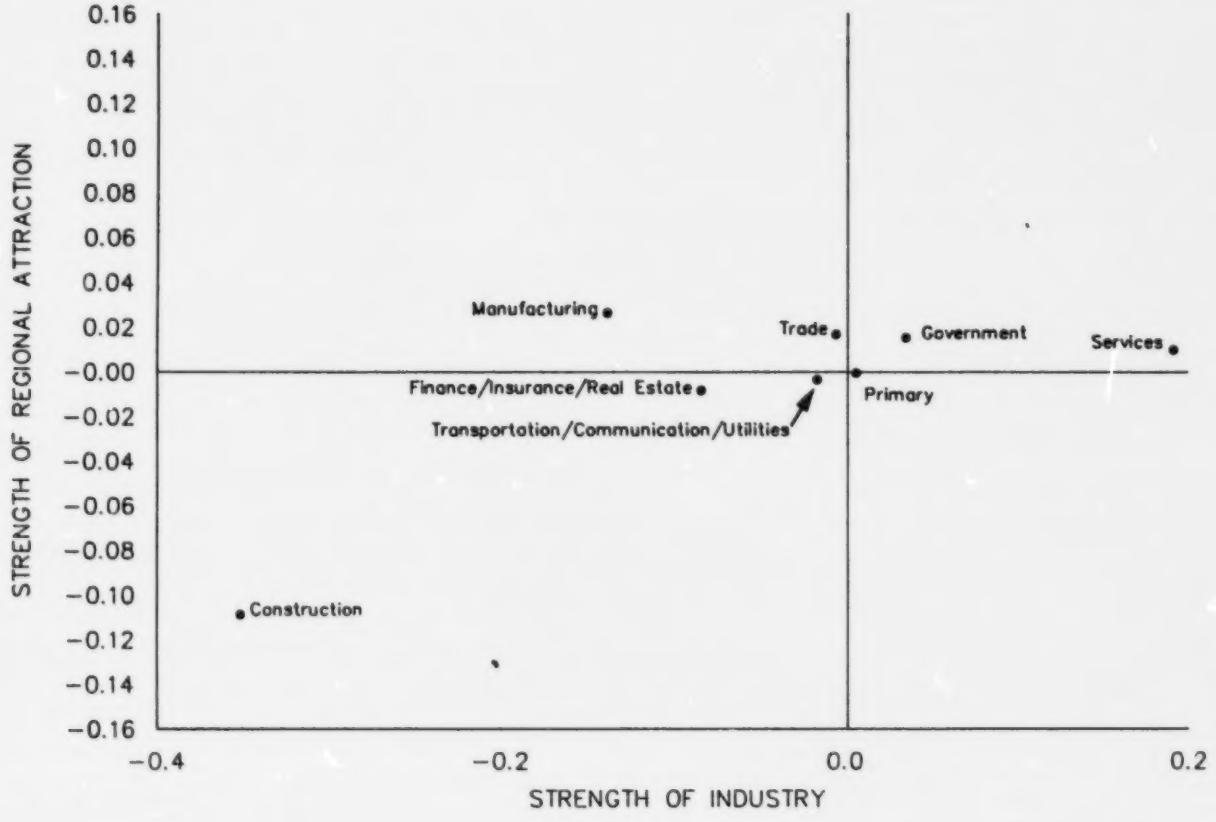
Alberta and the changes in the provincial economy overall. Negative results show that employment in the industry grew more slowly than employment in the provincial economy overall, while positive results show that sector accounted for a decline of 20 jobs. The net result is an increase of about 2,925 jobs.

Figure 3.2 shows a summary of the data from the shift-share analysis of employment within the region and Alberta.[14] As in Figure 3.1, the vertical scale represents the performance of local economic sectors as compared to provincial economic sectors. The horizontal scale represents the performance of provincial sectors compared to the provincial economy as a whole. Those sectors that grew both provincially and regionally appear in the upper right-hand quadrant of the graph. Those that grew provincially but declined regionally appear in the bottom right-hand quadrant. The bottom left-hand quadrant represents sectors that declined both regionally and provincially. Finally, the upper left-hand quadrant contains those sectors that declined provincially but grew regionally.

This analysis can be used to demonstrate general strengths and weaknesses in the region, relative to the province. Our region appears to have an advantage in the services, government, manufacturing, and trade sectors when compared to the province as a whole. In each of these categories, the regional sectors performed better than their Alberta counterparts. The region did worse than the province, however, in the primary sector, and the transportation, communication and utilities, finance, insurance and real estate, and construction sectors declined both regionally and provincially. Note that these sectors declined more slowly in the region than in Alberta as a whole.

One interesting feature of this graph is the clustering of the points around the "zero" level. The performance of the regional sectors is therefore very close to - whether above or below - the performance of the provincial sectors. This is also supported by the net result of all changes in employment, which is a decline of only 0.7%, after controlling for province-wide employment growth.

Figure 3.2
SUMMARY OF REGION TO ALBERTA ANALYSIS



A brief comparison of Figure 3.1 and 3.2 shows our region's varying competitiveness, depending on the reference economy. For both Canada and Alberta, the region appears strong in the service and government sectors. Compared to the overall Canadian economy, our region seems to have an advantage in the primary and transportation, communication and utilities sectors. Compared to Alberta's economy, however, our region's strengths lie in manufacturing and trade. The construction sector is a weakness in both comparisons, and its rapid decline is likely a result of its dependence on other sectors of the economy and a possible over-supply caused by rapid deveopment during the boom years of the late 1970's and early 1980's.

Again, these results cannot be separated from the very turbulent times they represent. Previous time periods and the current time period may show very different patterns.

The effects of each component of the change in employment are shown in Table 3.4. As calculated above, changes in employment in each sector can be divided into three components: the stength of the provincial economy, the strength of the industry in the overall provincial economy, and the strength of the regional attraction.

Clearly, the strength of the provincial economy was responsible for employment growth during this period, overall and for each sector, with the exception of the services category. The strength of the regional attraction appears to have been a factor in employment growth primarily in the trade and manufacturing sectors, although its contribution was relatively minor. Overall, a relatively weak regional attraction resulted in a loss of over 1500 jobs and the overall weakness of the industry mix resulted in a decline of over 1,000 jobs in the region.

The shift-share analysis, then, shows that employment growth in the Calgary region was heavily dependent on employment growth in both the national and provincial economies. Under the cirucmstances of the period from 1981 to 1986, therefore, stagnant conditions in these reference ec-

Table 3.4

Changes in Employment by Component

Sector	Strength of Provincial Economy	Strength of Industry	Strength of Regional Attraction
Primary	2714	229	-20
Manufacturing	2473	-5151	+967
Construction	2997	-15867	-4912
Transportation, Utilities and Communications	2158	-510	-65
Trade	4274	-347	+1086
Finance, Insurance and Real Estate	1784	-2256	-220
Government	1410	744	331
Other Services	7678	22111	1247
Total	25488	-1047	-1586

onomies would have serious effects on employment growth in the region, while a stagnant regional economy would have less of an impact. Under the current circumstances of gradual recovery, it is possible that the role of the provincial and national economics will remain strong, certain fast-growing industries will contribute employment growth, and the regional attraction will reverse the decline of the previous period.

4.0 INCOME TRENDS FOR THE CALGARY REGION

The previous two chapters attempted to demonstrate the relative significance of different major industry groups as employers of the Calgary region's residents. This chapter first uses data on the average weekly earnings of employed people in different major industry groups to illustrate a different way of measuring the significance of those industry types. The second section of the chapter tracks recent trends for annual income throughout the region.

4.1 Income by Industry Category

Table 4.1 shows the annual average of average weekly earnings for selected major industrial groups for Calgary over the last six years.[15] The figures for Calgary were chosen because they likely represent the trends in the Calgary region quite closely and because there are very few differences between the Calgary figures and their province-wide counterpart. (Note that these figures do not account for inflation).

Earnings in the mines, quarries, and oil wells sector consistently led all other major industry groups, while earnings in the trade sector have been consistently lower than in other categories. Figure 4.1 illustrates the differences between the high end of the range and the low end, with the industrial aggregate serving as the average between the two.

Table 4.1 also shows the total growth rate for each category between 1983 and 1988. The rate of change in earnings for all industries was about 12%. This figure was exceeded by the financial, insurance and real estate sector, the mines, quarries and oil wells sector and the transportation, utilities and communication sector. Earnings in the trade, manuacturing and services sectors increased at a rate below the average, and earnings in the construction sector actually declined slightly.

Figure 4.2 shows the trends for those industries where weekly earnings averaged higher than the industrial aggregate and Figure 4.3 shows the

Figure 4.1
RANGE OF AVERAGE WEEKLY EARNINGS
Source: Alberta Bureau of Statistics

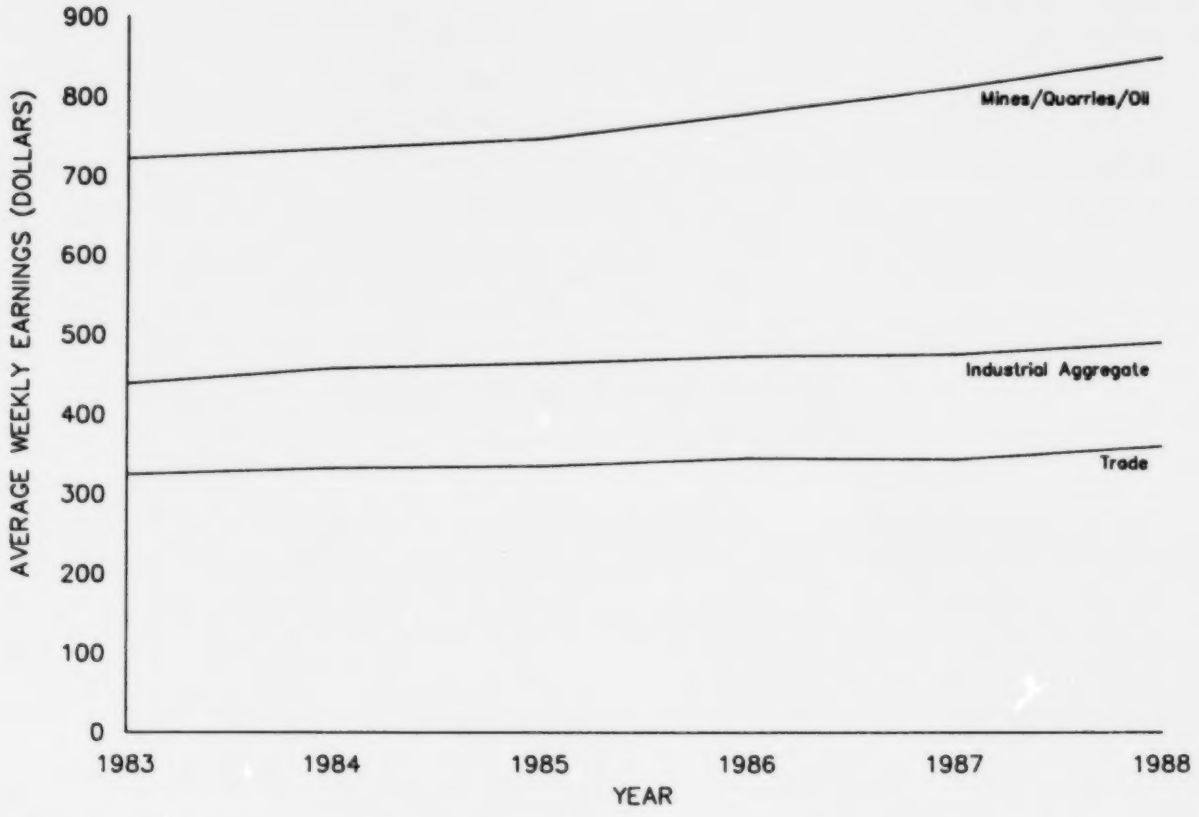


TABLE 4.1

AVERAGE WEEKLY EARNINGS BY INDUSTRY FOR CALGARY

INDUSTRY*	1983	1984	1985	1986	1987	1988	% Change 1983-1988
Industrial Aggregate	439.17	458.65	465.43	474.16	476.79	491.53	11.9
Mines, Quarries & Oil Wells	722.62	748.19	770.49	779.18	811.86	850.36	17.7
Manufacturing	482.23	495.22	525.12	537.24	546.75	533.68	10.7
Construction	569.60	534.10	509.68	502.70	519.18	557.41	-2.1
Transportation, Communication & Utilities	523.46	550.37	567.03	584.53	590.99	611.90	16.9
Trade	324.59	333.01	335.74	345.75	344.27	360.65	11.1
Finance, Insurance & Real Estate	408.97	448.95	451.81	459.56	506.73	506.70	23.9
Community, Business and Personal Services	369.62	380.62	380.94	394.31	391.00	397.17	7.5

Source: Alberta Bureau of Statistics

*Data for agriculture and government categories are not available.

Figure 4.2
AVERAGE WEEKLY EARNINGS ABOVE AGGREGATE
Source: Alberta Bureau of Statistics

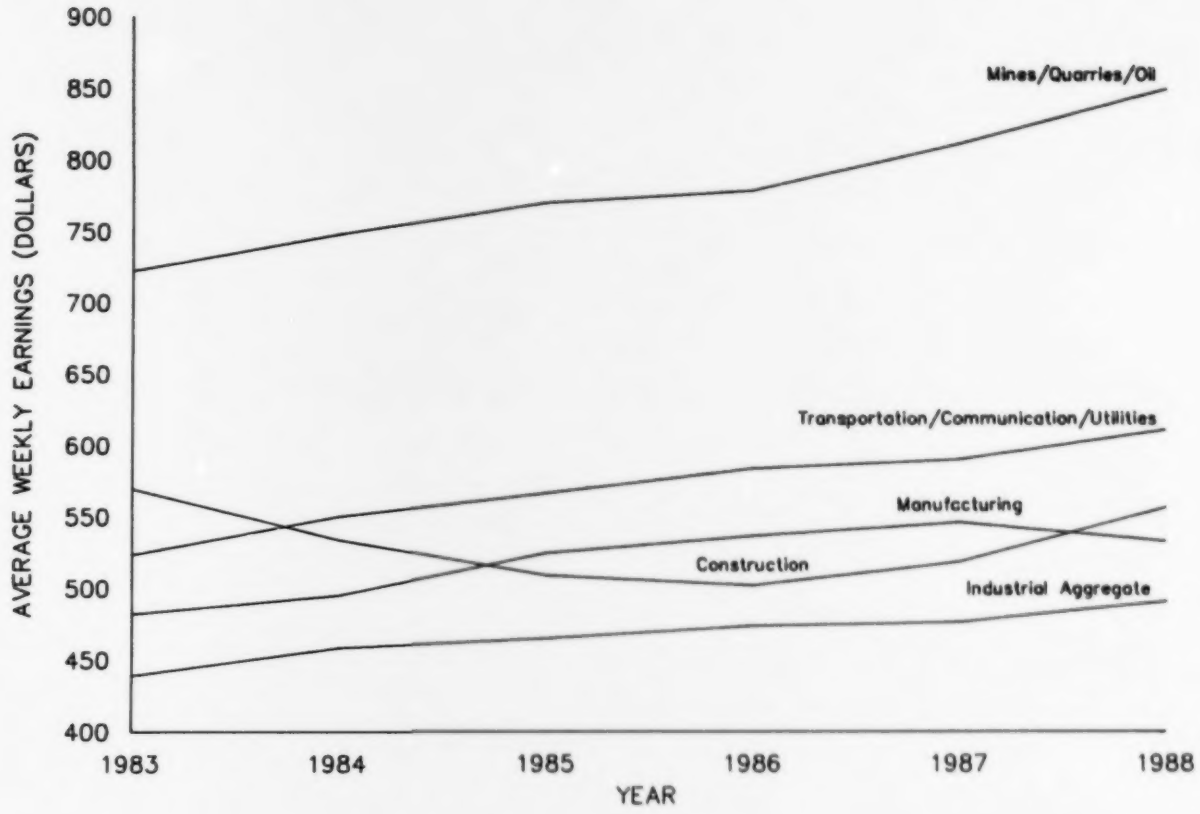
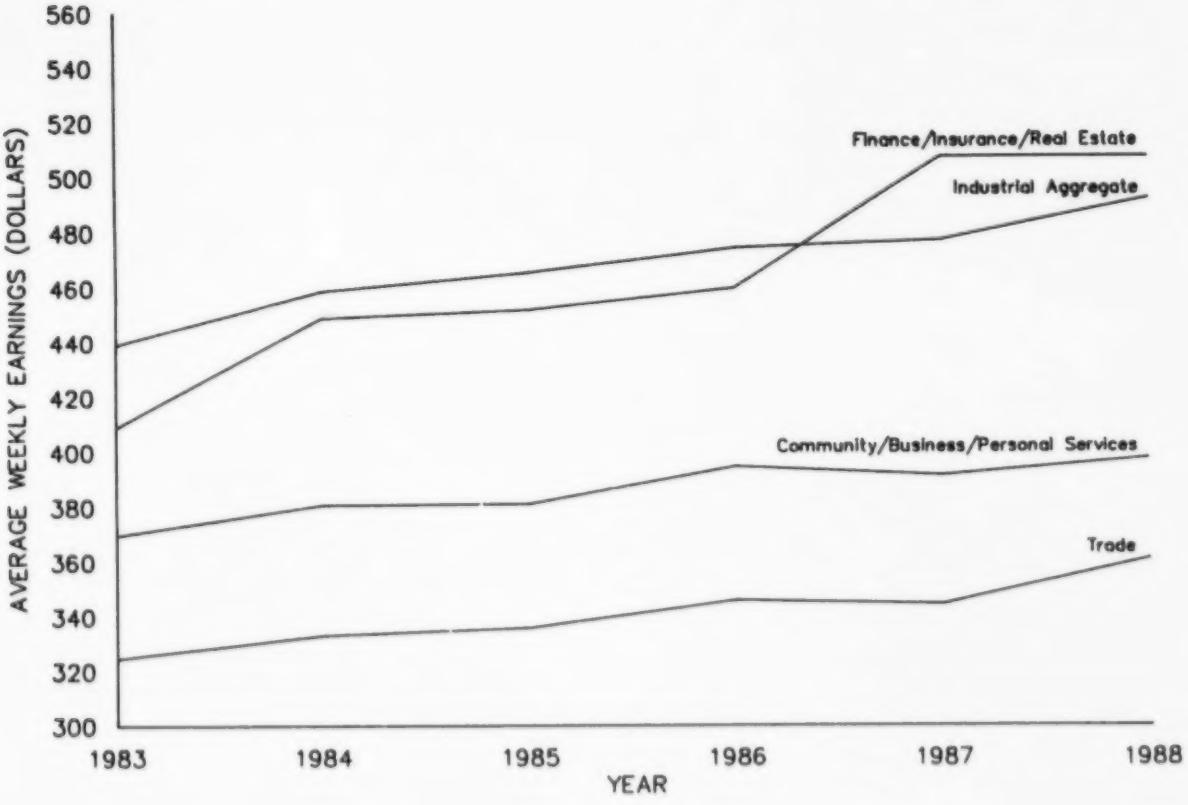


Figure 4.3
AVERAGE WEEKLY EARNINGS BELOW AGGREGATE
Source: Alberta Bureau of Statistics



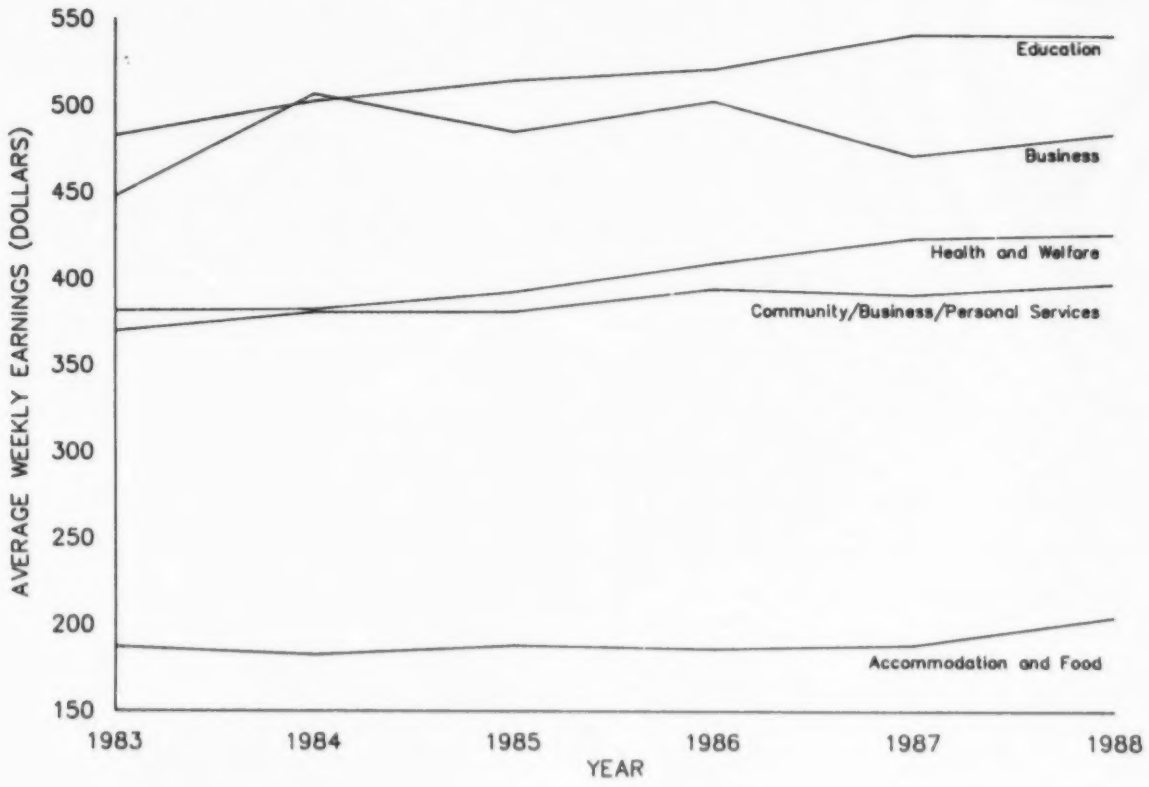
trends for those industries where weekly earnings averaged lower than the industrial aggregate. The sectors in which average weekly earnings exceeded the industrial aggregate figure are mines, quarries, and oil wells, manufacturing, construction and transportation, communication and utilities. Average weekly earnings averaged below the industrial aggregate in the finance, insurance and real estate, community, business and personal services, and trade sectors. Although these last two categories employ significant numbers of people in the Calgary region, they contribute average weekly earnings below other sectors.

Given the significance of the services sector as an employer, its rapid growth rate during the 1980's, and the range of services included in the category, some closer examination may be warranted. Figure 4.4 shows the trend in average weekly income for the sector as a whole and for its main components. Education, health and welfare, accommodation and food services, and services to businesses are shown.

The trend lines illustrate that, among the services, education and services to business showed the highest average weekly earnings. The health and welfare component tends to approximate the trend of the overall services category, while average weekly earnings in accommodation and food services were consistently low. In fact, earnings in this group were, on average, only about one-third as much as the earnings in the education services category.

Generally, the differences in average weekly earnings among the major industry groups may reflect the proportion of professional people or highly-skilled trades people employed in the sector (a higher proportion contribute to above-average earnings) or the proportion of part-time positions in the sector (a higher proportion would contribute to below - average earnings).

Figure 4.4
AVERAGE WEEKLY EARNINGS FOR SERVICES
Source: Alberta Bureau of Statistics



4.2 Average Annual Income

Statistics Canada, as part of the federal census, publishes information on average annual income for working males and females, and for families and households.* The data are available for most municipalities in the Calgary region, although data for some small municipalities are not published to protect confidentiality. (See Appendix 1 for average annual income figures by municipality).

Figure 4.5 compares the average for the Calgary region with the average for the province in each category.[16] In all cases, the regional average is about the same as the provincial average, although incomes for females and families tend to be lower in the region. There are more significant differences between the averages for the region surrounding Calgary and the City of Calgary, as shown on Figure 4.6. On average, incomes in all categories throughout the region outside the City tend to be lower than incomes within Calgary. Of course, there is a great deal of variation among the municipalities in the surrounding region, and average incomes in several municipalities are higher than those in Calgary.

The same general relationships held true in 1980: the regional average closely paralleled the provincial average with the exception of lower incomes for females within the region, and the average for the region surrounding Calgary tended to be lower than the average for Calgary.

Figure 4.7 shows the change in average household income between 1980 and 1985 for each of the region as a whole, the City of Calgary, and the region outside the city.[17] Household incomes increased most rapidly in

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* Families are defined by Statistics Canada as a husband and wife with or without children, or a lone parent of any marital status with one or more children, living in the same dwelling. Households are defined as a person or a group of persons who occupy a dwelling. It includes family groups with or without lodgers or employees, two or more families sharing a dwelling, a group of unrelated persons, or one person living alone. Thus, family income would include the income of all members of the family and household income would include the income of all members of the household.

Figure 4.5
AVERAGE INCOMES FOR ALBERTA AND THE CALGARY REGION

Source: Statistics Canada

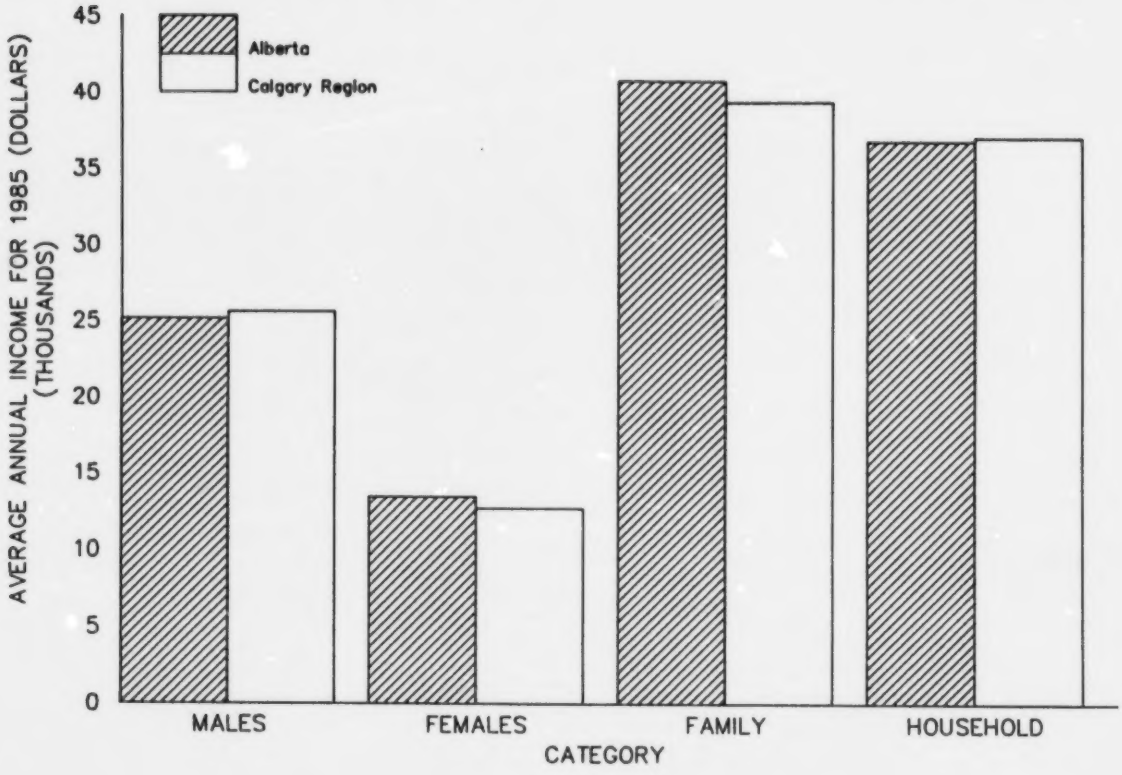


Figure 4.6
AVERAGE INCOMES FOR CALGARY AND SURROUNDING REGIONS

Source: Statistics Canada

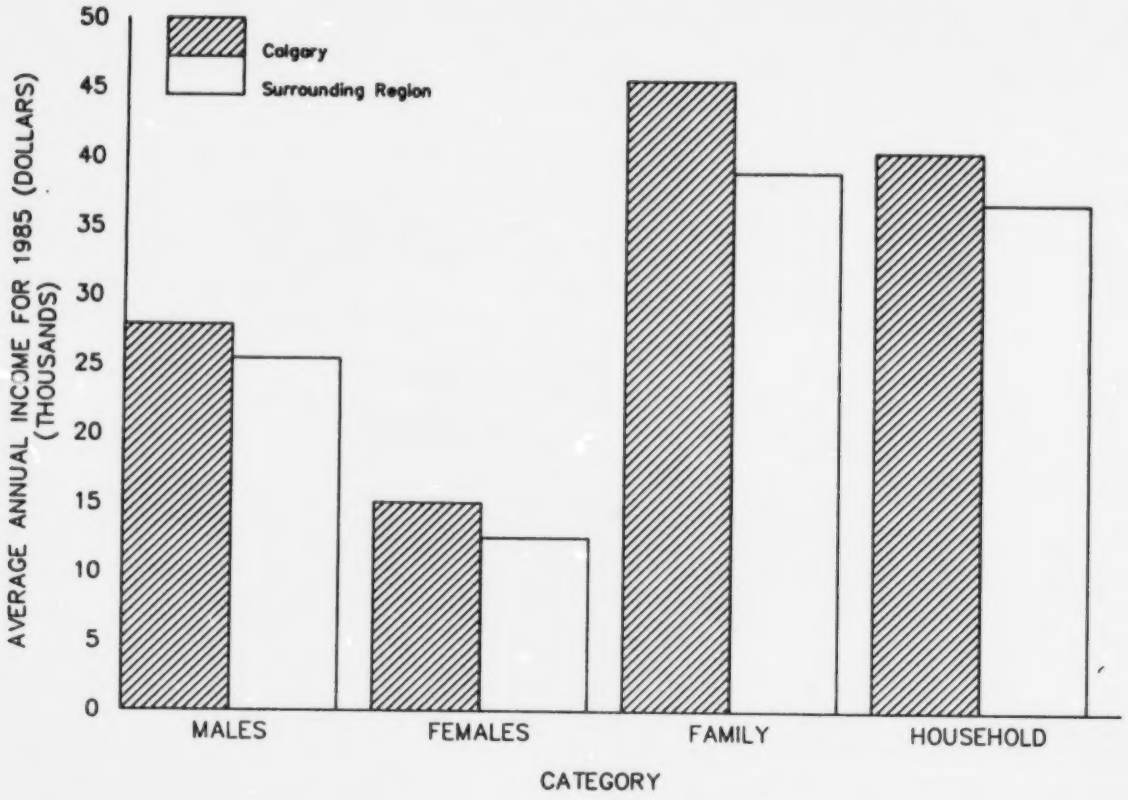
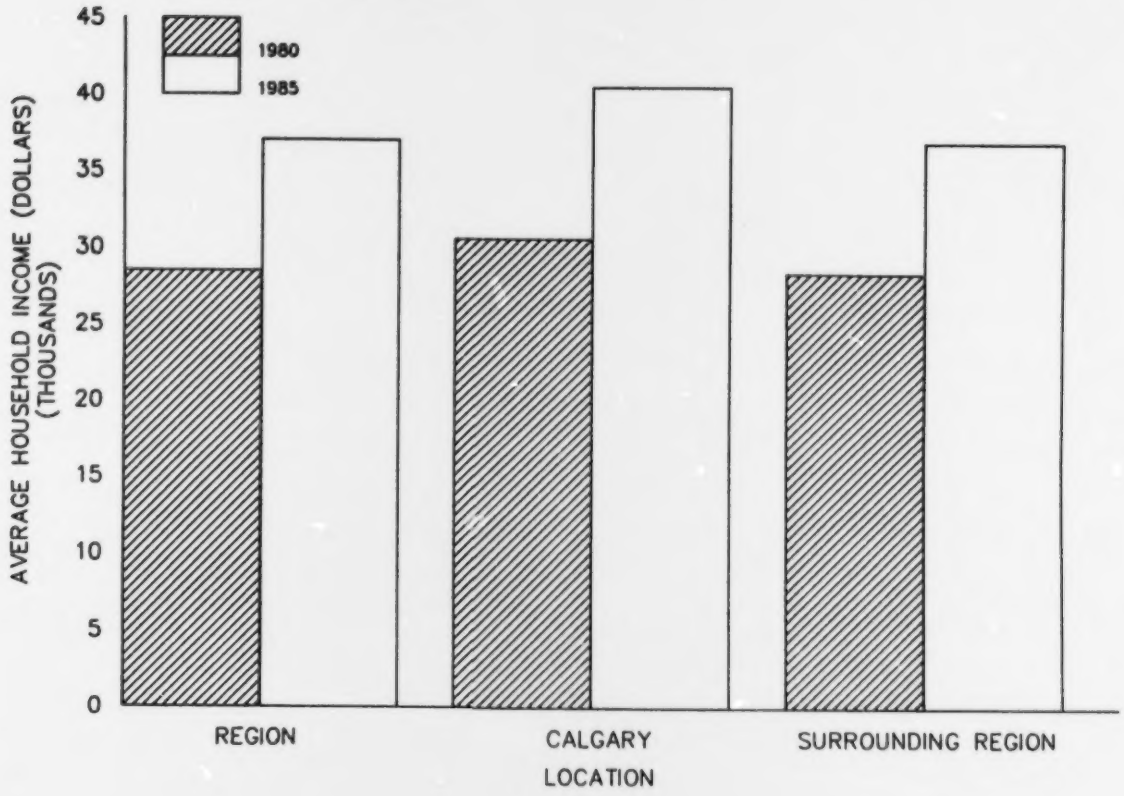


Figure 4.7
AVERAGE HOUSEHOLD INCOME: 1980-1985
Source: Statistics Canada



Calgary, with a growth rate of over 32% over the five-year period, while, on average, household incomes in the region surrounding Calgary increased by almost 30%.

The figures for 1985 show that incomes in most municipalities were within 10% of the average for the whole region. Seven municipalities had average incomes more than 10% higher than the regional average. In two municipalities (Chestermere Lake and Rocky View), incomes were more than 10% higher than the regional average in all categories, and in Foothills incomes were more than 10% above the regional average in all categories except females. Other municipalities in this higher than average category include Calgary, Airdrie, Cochrane and Okotoks.

Note that the municipalities in the surrounding region with above-average annual incomes are also municipalities with relatively high proportions of the working adult population who commute to Calgary for employment* (at least 40%).[18] This suggests that average incomes are higher in these communities because a large percentage of workers are earning their incomes in Calgary where incomes also tend to be above average. Conversely, those municipalities with fewer than 40% of the employed adult population commuting to Calgary for work are ** much more likely to have average annual incomes 10% or more below the regional average. In the average household income category, these include Beiseker, Black Diamond, Gleichen, High River, Longview, Rockyford and Turner Valley. Figure 4.8 shows a comparison among the average for commuting municipalities, the average for the region and the average for non-commuting municipalities.

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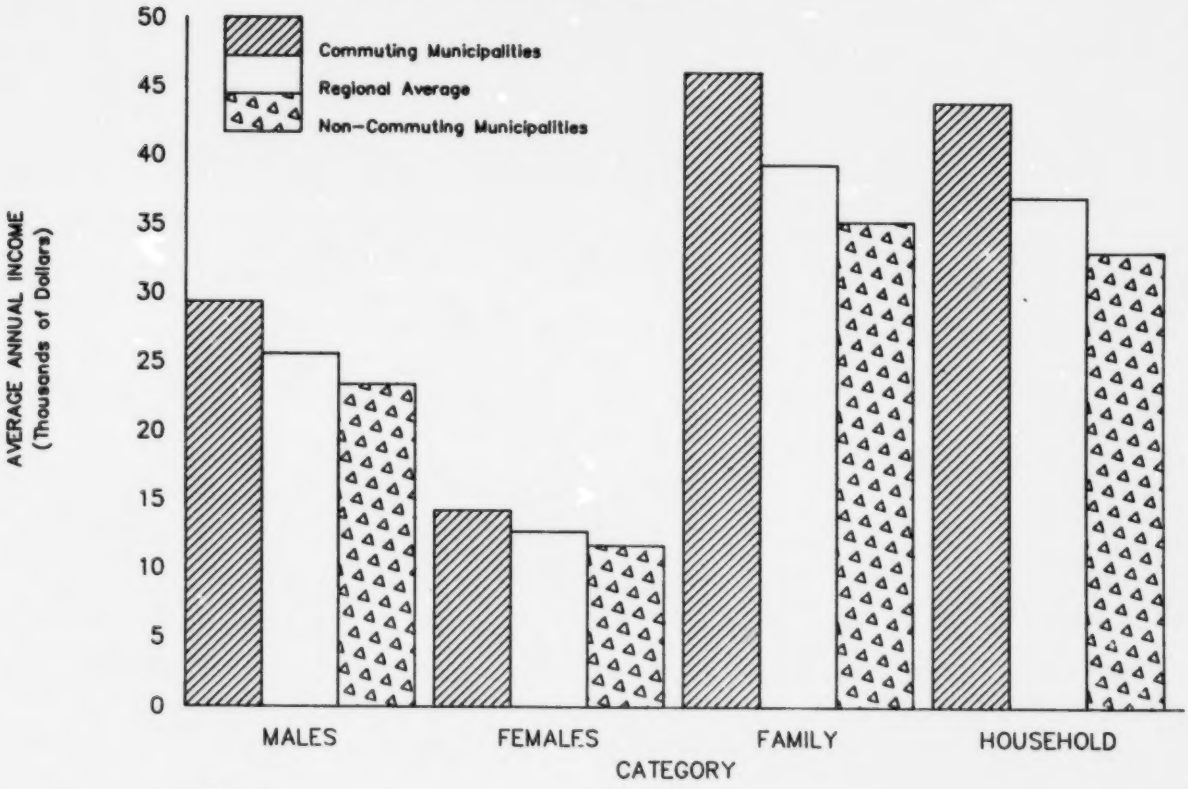
* These commuting municipalities are Airdrie (54.7% employed in Calgary), Chestermere Lake (84.2%), Cochrane (43.4%), Foothills (42.6%), Irricana (49.1%), Okotoks (54.7%) and Rocky View (figure not available, but estimated to be greater than 40% because of proximity to Calgary and numbers of people employed in Calgary-based industries).

** These non-commuting municipalities are Beiseker, Bighorn, Black Diamond, Canmore, Crossfield, Gleichen, High River, Longview, Rockyford, Standard, Strathmore, Turner Valley and Wheatland.

Figure 4.8
COMPARISON OF COMMUTING AND NON-COMMUTING MUNICIPALITIES

Source: Statistics Canada, Municipal Census Program, C.R.P.C.



On average, urban municipalities with populations between 1,000 and 2,000 people have income levels below the regional average in three of the four categories.

Analysis beyond the scope of the report would be necessary to isolate the factors contributing to average income levels and examine the links among them. At first glance, however, the following conclusions can be drawn:

- Income levels are influenced by the industry in which people are employed.

- The location of employment (e.g. Calgary versus the surrounding region) may be a factor.

- The size and type of municipality may influence income levels. "Service centre" types of municipalities for example, with large proportions of the employed adult working in the trade and service sectors, may have lower average incomes than municipalities that do not rely heavily on these industries.

- Average family and household incomes are obviously influenced by the number of income earners within the family or household group, and by the labour force participation rates for males and females. For example, some municipalities have higher than average income levels for females, but because, on average, fewer females are employed, this does not translate into higher than average family or household incomes. Higher than average income levels for males, however, are reflected in above average family and household incomes.

- There may be links among population size, proximity to Calgary, the extent of commuting to Calgary for employment, labour force participation rates, and income levels.

5.0 CONCLUSION

Based on this analysis of employment and income patterns, some observations can be made about the various sectors of the economy.

- The **services** sector, in terms of the numbers of people employed and its rate of growth during the 1980's, is the most successful sector in the regional economy. According to the shift-share analysis, this sector is also one of the Calgary region's strengths when compared to both the national and provincial contexts. Certain components of the service industry, notably services to businesses, are important in attracting commuters to Calgary from the surrounding region. Accommodation and food services are also significant in employing residents of the region surrounding Calgary who do not commute to Calgary. However, earnings in this sector have been below the industrial aggregate throughout the 1980's, and have increased more slowly than average throughout the decade. The accommodation and food services component, in particular, is characterized by low earnings.

- The **primary** sector, including both the agriculture industry and the oil and gas industry, is a major employer in the Calgary region. The agriculture industry is a significant employer for non-commuting residents of the region surrounding Calgary, while the oil and gas component is a major employer or residents of the region who commute to Calgary for work. Earnings in the oil and gas sector are consistently the highest among the industry groups and increased at an above-average rate during the 1980's. Despite this, the regional primary sector's performance has been weak in comparison to the provincial context.

- The retail **trade** sector is another major employer in the Calgary region, and has shown increases during the 1980's. Earnings in this sector, however, have been the lowest of all major industry groups during this decade. Although the sector performed

well nationally, the Calgary region's trade sector has been weak in comparison. On the other hand, the regional trade sector is strong in comparison to its provincial counterpart's performance.

- The regional **manufacturing** sector demonstrated little growth between 1981 and 1986, and mirrored the industry's poor national performance. It fared better, however, in comparison to the Alberta manufacturing sector. Earnings in this industry, although consistently above the industrial aggregate, increased at a below-average rate during the 1980's.

- Employment in the **construction** sector declined drastically during the 1980's, but the industry is still a significant employer of residents in the Calgary region. The regional sector fared much worse than its national counterpart, and shared the provincial industry's poor performance. Earnings in this sector declined during the decade, but began to recover by the end of the period. They remain above the industrial aggregate.

Further work is necessary for a more complete analysis of employment and income patterns in the Calgary region. Such work might include additional shift-share analysis of periods prior to the 1980's and of the current period when data become available, and additional analysis of the factors affecting income and earning levels, which may include population, participation rates, proximity to Calgary, the numbers of commuters to Calgary, the size of a municipality's trading area, and the proportion of professional, highly-skilled and part-time employees in each industry.

Future editions of Prospect focusing on economic issues should also include more direct analysis of the different sectors of the economy, especially those of significance to the Calgary region, and some analysis of the businesses operating in the region and their general performance.

By focusing on employment and income issues, this report has demonstrated

how readily available federal and municipal data can be used not only to illuminate those issues, but also to assess the performance of various sectors of the economy, and to provide a basis for further monitoring and analysis.

NOTES

1. Statistics Canada, 1986 Profiles: Census Divisions and Subdivisions, 94-118, September, 1988.

2. Statistics Canada, 1981 Census Divisions and Subdivisions: Selected Social and Economic Characteristics, July, 1983.

3. Statistics Canada, 1988 op. cit.

4. Statistics Canada, 1983 op. cit.

5. Dasso, Jerome. "Techniques of Area Analysis" in Appraisal Journal, October 1987. pp. 578-591.

6. Ibid, p. 582.

7. Landis, John D. "Electronic Spreadsheets in Planning: The Case of Shiftshare Analysis" in American Planning Association Journal, Spring 1985. p. 217.

8. Landis calls this the proportional shift factor. Ibid.

9. Landis calls this the differential shift factor. Ibid.

10. Dasso op. cit. and Landis op. cit.

11. The analyses were performed using the Lotus 1-2-3 spreadsheet template provided in Landis op. cit.

12. The figure was prepared based on a method described by Landis Ibid pp. 220-21.

13. Ibid, pp. 221-222.

14. This figure was prepared based on Landis's method (See note 12).

15. Alberta Bureau of Statistics, Average Weekly Earnings, All Employees. Calgary, January 1989.

16. Statistics Canada, 1983. op. cit.

17. Statistics Canada, 1988 op. cit. and Statistics Canada, 1983 op. cit.

18. Calgary Regional Planning Commission, Municipal Census Program.

APPENDIX 1

AVERAGE ANNUAL INCOME BY LOCATION AND CATEGORY, 1985

LOCATION	MALES	FEMALES	FAMILY	HOUSEHOLD
CANADA	23,265	12,615	37,827	34,261
ALBERTA	25,145	13,454	40,740	36,796
AIRDRIE	26,769	12,498	38,931	38,230
BEISEKER	16,443	12,483	28,653	25,229
BIGHORN	25,484	13,118	40,451	37,794
BLACK DIAMOND	20,609	11,251	30,366	24,774
BLACKIE	N/A	N/A	N/A	N/A
CALGARY	27,893	15,091	45,624	40,533
CANMORE	23,176	12,459	38,431	35,148
CAYLEY	N/A	N/A	N/A	N/A
CHESTERMERE LAKE	31,273	17,873	53,321	50,209
CLUNY	N/A	N/A	N/A	N/A
COCHRANE	28,057	13,694	43,040	40,392
CROSSFIELD	29,822	11,423	42,117	40,024
FOOTHILLS	35,100	13,937	55,699	52,789
GHOST LAKE	N/A	N/A	N/A	N/A
GLEICHEN	21,951	10,094	31,705	29,318
HIGH RIVER	24,676	13,044	38,203	34,074
HUSSAR	N/A	N/A	N/A	N/A
IRRICANA	24,157	13,471	35,461	31,783
LONGVIEW	23,099	8,186	29,096	30,994
OKOTOKS	27,638	12,788	40,446	39,373
ROCKY VIEW	32,398	15,338	55,826	54,401
ROCKYFORD	21,565	13,261	30,623	30,226
STANDARD	27,502	12,309	40,374	39,766
STRATHMORE	24,149	12,825	37,316	33,481
TURNER VALLEY	23,506	9,562	32,785	32,724
WAIPAROUS	N/A	N/A	N/A	N/A
WHEATLAND	22,077	11,897	38,121	36,452

Source: Statistics Canada

Average income for males and females refers to the weighted mean total income of individuals 15 years of age and over who reported income in 1985.

Average census family income refers to the weighted mean total income of census families in 1985.

Average household income refers to the weighted mean total income of households in 1985.

APPENDIX II
EXAMPLES OF OCCUPATION AND INDUSTRY CATEGORIES

OCCUPATION CATEGORY:	INCLUDES:
Managerial, Administrative	government officials and administrators, other managers, accountants, personnel officers
Teaching	university, elementary and secondary school teaching
Medicine, Health	health diagnosing and treating, nursing, therapy, pharmacists, dietitians, optometrists, etc.
Technological, Social, Religious, Artistic	natural sciences, engineering, architects, planners, mathematics, statistics, drafting, social sciences, social work, law, library sciences, ministers, nuns, brothers, fine and commercial art, photography, performing and audio-visual arts, writing
Clerical	stenographic, typing, bookkeeping, electronic data processing, library, file and correspondence clerks, reception
Sales	sales of commodities, sales of services (e.g. insurance, advertising)
Service	protective service, food and beverage preparation and service, lodging and accommodation, personal services (e.g. hairdressers, housekeepers)
Primary	farming, horticultural and animal husbandry, fishing, trapping, forestry and logging, mining and quarrying, oil and gas field occupations
Processing	processing of mineral ore, metal, clay, glass, and stone, chemicals, petroleum, rubber, plastic, food, beverages, wood, pulp and paper, textiles

APPENDIX II
EXAMPLES OF OCCUPATION AND INDUSTRY CATEGORIES

OCCUPATION CATEGORY: (continued)	INCLUDES:
Machining, Product Fabricating, Assembling and Repairing	metal machining and shaping, wood machining, clay, glass and stone machining, fabricating of metal products, electrical and electronic products, wood products, textile, fur, and leather products, rubber products, plastic products, mechanics and repairers
Construction Trades	excavating, grading, paving, electrical power, lighting, communications equipment, carpenters, masons, plasterers, painters, pipefitters and plumbers, roofers, structural metal erectors, etc.
Transport Equipment Operating	air, railway, water, and motor transport
Other	material handling, printing, utilities equipment, electronic equipment operating

Source: Statistics Canada, Standard Occupational Classification, 1980, Minister of Supply and Services, Canada, February 1981, Catalogue 12-565E.

APPENDIX II
EXAMPLES OF OCCUPATION AND INDUSTRY CATEGORIES

INDUSTRY CATEGORY:	INCLUDES:
Primary	agriculture and forestry, mining and oil
Manufacturing	manufacture of food, beverages, rubber, plastics, leather, textiles, clothing, wood, furniture, paper, printing, publishing, primary metals, fabricated metals, machinery, transportation equipment, electrical and electronic products, non-metallic mineral products, refined petroleum and coal products, chemical products
Construction	building, developing, general contracting, industrial and heavy construction, trade contracting
Transportation, Communication and Utilities	transportation, pipeline transport, storage and warehousing, broadcasting, telecommunication, postal services, utilities
Trade	wholesale, retail
Finance, Insurance, and Real Estate	chartered banks, consumer loan companies, investment companies, insurance, real estate operators, real estate agencies
Government	federal, provincial, and local governments
Other Services	business services (employment, computer, accounting services, advertising, architects, lawyers, management consultants), education, health, and social services (institutions, child care), accommodation and food services, personal services, amusement and recreation services

Source: Statistics Canada, Standard Industrial Classification, 1980, Minister of Supply and Services, Canada, December 1980, Catalogue 12-501E